

ONTARIO MINISTRY OF ENVIRONMENT



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1965 ~~OPERATING~~ COST SUMMARY

OWRC WATER POLLUTION CONTROL PLANTS

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1965 OPERATING COST SUMMARY

WATER POLLUTION CONTROL PLANTS

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations.



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1985 OPERATING COST REPORT

WHITE PRAIRIE WATERS PLANT

ONTARIO WATER RESOURCES BOARD

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PLANTS INCLUDED IN REPORT

PRIMARY

			<u>Sludge Handling</u>	<u>Design Flow (MGD)</u>
1.	Belleville	61-S-84	Digestion	3.0
2.	Fort Erie	59-S-39	Digestion	1.8
3.	Fort Frances	60-S-59	Digestion	2.0
4.	Fort William	61-S-91	Digestion	6.0
5.	Owen Sound	60-S-68	Digestion	3.0
6.	Point Edward	59-S-36	Digestion	0.57
7.	Port Arthur	58-S-13	Digestion	4.0
8.	Port Dover	62-S-115	Vacuum Filtration	2.1
9.	Sault Ste. Marie	59-S-20	Vacuum Filtration	8.0
10.	Timmins	60-S-71	Digestion	3.0
11.	Trenton	57-S-4	Digestion	1.0

CONVENTIONAL ACTIVATED SLUDGE

12.	Brantford	58-S-11	Digestion, Vacuum Filtration	12.5
13.	Brampton	58-S-14	Digestion	2.0
14.	Burlington D. L.	60-S-51	Digestion	2.5
15.	Burlington E. G.	58-S-28	Digestion	0.75
16.	Coniston	57-S-8	Digestion	0.26
17.	Elmira	61-S-96	Digestion	0.68
18.	Fergus	58-S-23	Digestion	0.60
19.	Galt	61-S-90	Digestion, Vacuum Filtration	5.0
20.	Georgetown	58-S-17	Digestion	1.5
21.	Huntsville	58-S-15	Digestion	0.25

PRIMARY

Station No.	Sludge Handling	Station No.	Sludge Handling	Station No.	Sludge Handling
1.0	Digestion	61-8-24	Digestion	1.0	Digestion
1.8	Digestion	59-8-23	Digestion	1.8	Digestion
2.0	Digestion	60-8-22	Digestion	2.0	Digestion
2.0	Digestion	61-8-21	Digestion	2.0	Digestion
2.0	Digestion	60-8-20	Digestion	2.0	Digestion
0.27	Digestion	59-8-19	Digestion	0.27	Digestion
4.0	Digestion	58-8-18	Digestion	4.0	Digestion
4.1	Vacuum Filtration	62-8-17	Vacuum Filtration	4.1	Vacuum Filtration
8.0	Vacuum Filtration	59-8-16	Vacuum Filtration	8.0	Vacuum Filtration
8.0	Digestion	60-8-15	Digestion	8.0	Digestion
1.0	Digestion	57-8-14	Digestion	1.0	Digestion

CONVENTIONAL ACTIVATED SLUDGE

12.0	Digestion, Vacuum Filtration	58-8-11	Digestion, Vacuum Filtration	12.0	Digestion, Vacuum Filtration
4.0	Digestion	59-8-10	Digestion	4.0	Digestion
4.0	Digestion	60-8-09	Digestion	4.0	Digestion
0.75	Digestion	58-8-08	Digestion	0.75	Digestion
0.20	Digestion	57-8-07	Digestion	0.20	Digestion
0.01	Digestion	61-8-06	Digestion	0.01	Digestion
0.05	Digestion	58-8-05	Digestion	0.05	Digestion
2.0	Digestion, Vacuum Filtration	61-8-04	Digestion, Vacuum Filtration	2.0	Digestion, Vacuum Filtration
1.5	Digestion	59-8-03	Digestion	1.5	Digestion
0.05	Digestion	58-8-02	Digestion	0.05	Digestion

22.	Kingston Twp.	61-S-98	Digestion	0.83
23.	Kitchener	58-S-19	Digestion, Vacuum Filtration	13.5
24.	Lakeview	59-S-43	Digestion	5.0
25.	Markham	59-S-40	Digestion	0.334
26.	Nepean Twp.	59-S-35	Digestion	1.5
27.	Newmarket	61-S-87	Digestion	2.0
28.	North Bay	58-S-10	Digestion	4.0
29.	Orangeville	58-S-16		0.75
30.	Port Colborne E.S.		Digestion	0.85
31.	Port Colborne W.S.	59-S-47	Digestion	0.9
32.	Preston	59-S-46	Vacuum Filtration	1.8
33.	Richmond Hill	57-S-6	Digestion	1.6
34.	Sidney Twp.	62-S-121	Digestion	0.12
35.	Simcoe (Combined)	62-S-120	Digestion	2.0
36.	Stratford	57-S-2	Digestion	4.0
37.	Streetsville	57-S-5	Digestion	0.8
38.	Tillsonburg	58-S-12	Digestion	0.67
39.	Waterloo	58-S-122	Vacuum Filtration	4.0

TOTAL OXIDATION

40.	Burlington Sky.	62-S-105	Total Oxidation	3.125
41.	Elora	62-S-125	Total Oxidation	0.083
42.	Moore Twp.	61-S-88	Total Oxidation	0.32
43.	Paris	59-S-34	Total Oxidation	0.5
44.	Westminster	59-S-33	Total Oxidation	0.25
45.	Frankford (Trickling Filter)	57-S-9		0.12

OPERATING COSTS

The total costs of operating sewage treatment plants as used in this report are those involving the payroll of staff employed at the plants, fuel, power, chemicals, general supplies, equipment, repair and maintenance, sundry and water. The cost of head office supervision, including travel, accounting, purchasing and inspection is not included in the operating costs shown for each project.

An explanation of items included in each of the categories of the operating costs is as follows:

1. Payroll - Regular operators' salaries including pension and Workmen's Compensation payments.
 - Casual payroll - Salaries of labour employed on a temporary or part-time basis in time of staff shortage or for part-time work. Workemen's Compensation payments are also included.
2. Fuel - Includes fuel oil, natural gas, and/or propane used for heating.
3. Power - Includes hydro electric power and natural gas, gasoline, diesel oil if used for power generator.
4. Chemicals - Includes chlorine, ferric chloride, hydrated lime, pickle liquor, alum, sodium hypochlorite, odour control chemicals, activated carbon, sodium chloride, pipe cleaning materials (where applicable).
5. General Supplies - Includes laboratory reagents, laboratory equipment replacement, cleaning materials, lubricants, stationery, uniforms, light bulbs, instrument charts, books.
6. Equipment - Includes equipment to be used in the treatment process, laboratory, building and grounds and small tools.

OPERATING COSTS

The total costs of operating sewage treatment plants as used in this report are those involving the payroll of staff employed at the plants, fuel, power, chemicals, general supplies, equipment, repair and maintenance, waste and water. The cost of head office superintendents, including travel, accounts, purchasing and inspection is not included in the operating costs shown for each project.

An explanation of items included in each of the categories of the operating costs is as follows:

1. Payroll - Wages of operators, assistants including pension and gratuity, superannuation payments.
2. Fuel - Salaries of labour employed on a temporary or part-time basis in time of staff shortage or for extra time work. Workmen's compensation payments are also included.
3. Power - Includes fuel oil, natural gas, and/or power used for heating.
4. Chemicals - Includes hydro electric power and natural gas, ammonia, diesel oil is used for power generation.
5. General Supplies - Includes laboratory reagents, laboratory equipment, reagents, cleaning materials, lubricants, stationery, motor, light bulbs, instrument charts, books.
6. Equipment - Includes equipment as used in the treatment process, laboratory, building and grounds and small tools.

7. Maintenance - Includes goods and services (with the exception of OWRC staff) used in repairing and maintaining process, electrical and building equipment, inspections, packing, paint, etc.
8. Sundry - Includes express charges, telephone, telemetering, stamps, sludge haulage, etc.
9. Water - Includes all charges for water.
10. Travel - Includes operators' travel to local hardware stores, railroad station, conferences, conventions, etc. The cost of accommodation and meals associated with conferences and conventions is also included.

The operating costs of 45 OWRC operated sewage treatment plants are summarized in Tables No. I, No. II and No. III. In each table the plants are grouped as to the type of treatment, primary, conventional activated sludge or total oxidation. Frankford, a small trickling filter plant, is listed after the total oxidation plants in all tables.

Table No. I summarizes the total 1965 operating costs under each of the 11 cost categories for each plant. The four main cost categories; labour, power, maintenance and sludge disposal, are further described in Table No. II as to their percent of the total operating costs and their costs per million gallons of sewage treated. Table No. III summarizes the 1965 total average operating costs per million gallons of sewage treated, per pound of BOD₅ removed and per pound of suspended solids removed. Average values are given for each of the three types of treatment.

Figures No. I and No. II show a statistically derived regression line, by the least squares method, to represent the total operating costs per million gallons of sewage treated for the various design capacities. Also

shown are the limits of one standard error on each side of the regression line. Figure No. I represents conventional activated sludge treatment plants and Figure No. II represents primary treatment plants. A similar analysis was done in Figures No. III and No. IV for operating cost per million gallon of sewage treated for the actual flows treated by each plant.

OWRC WATER POLLUTION CONTROL PLANTS

TABLE 1

OPERATING COSTS

1965

PRIMARY TREATMENT

PROJECT	TOTAL	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIP	REPAIRS & MAINT.	SUNDRY	WATER	TRAVEL
BELLEVILLE	45,125.01	14,269.93	841.22	2105.67	7900.29	2119.75	1286.52	817.77	1642.63	12219.56	1352.57	565.90
FORT ERIE	24,836.97	10,524.84	794.97	1032.56	4563.51	1393.57	1028.08	526.29	800.02	3853.20		319.93
FORT FRANCES	29,310.65	14,877.03	103.44	2115.43	4811.01	1164.57	1354.08	1182.25	706.77	1569.95	200.00	1226.12
FORT WILLIAM	53,523.57	26,592.36	2374.99	3210.48	7304.01	3096.51	1990.18	2472.80	2083.30	3520.17	243.90	634.87
OWEN SOUND	34,109.32	11,123.26	4336.79	1550.20	4775.78	1421.58	1015.25	781.13	1929.94	5217.12	1568.11	390.16
POINT EDWARD	13,272.64	6,059.86		1620.03	879.48	1062.20	470.93	389.51	673.74	1237.50	725.21	154.18
PORT ARTHUR	44,533.19	14,325.94	7424.93	1314.30	5584.06	3136.35	1962.13	1347.20	1322.71	6106.06	1772.18	237.33
PORT DOVER	23,343.94	10,257.87			6028.10	2132.02	666.37	1788.06	1638.48	233.67		599.37
SAULT STE. MARIE	122,349.41	50,678.34	3738.70	2971.86	16196.72	11267.16	2954.30	2598.63	7974.05	21253.86	2178.76	537.03
TIMMINS	31,001.30	9,835.79	3709.38	3117.45	4701.11	2060.30	1467.43	959.19	1465.59	3102.10		582.96
TRENTON	19,519.53	6,298.74	399.74	218.44	2552.08	2240.25	988.16	1377.90	1676.00	1305.47	2097.41	365.34

CONVENTIONAL ACTIVATED SLUDGE SECONDARY PLANTS

BRANTFORD	185,704.83	108,765.52	2699.42	1149.59	24748.80	23175.03	4908.77	1686.04	5737.88	10296.39	1923.87	613.52
BRAMPTON/												
CHINGUACOUSY	55,678.76	16,615.31	6227.01		6294.18	5152.57	1617.07	1961.09	4010.08	11572.76	1893.29	335.40
BURLINGTON D.L.	37,586.43	15,963.55	755.20	140.31	6186.78	4186.27	888.30	597.78	1163.40	7468.47	166.17	70.20
BURLINGTON E.G.	21,966.58	11,887.91		765.66	3452.32	1112.46	693.20	363.59	716.49	2162.07	599.88	213.00
CONISTON	12,495.59	5,195.03	2164.42	486.31	1056.58	339.91	388.85	238.56	1219.99	679.20		726.74
ELMIRA	26,960.67	14,387.91	1633.87	1800.19	2505.42	1356.93	1454.24	659.15	430.43	1135.89	1130.44	466.20
FERGUS	21,760.15	9,305.11	259.44	582.74	1278.14	1098.98	868.03	957.08	857.88	4549.83	852.57	250.35
GALT	73,672.49	33,303.33	4876.88	4193.87	7142.65	10026.94	2822.20	2174.42	5226.70	2679.96	881.34	344.20
GEORGETOWN	31,209.58	15,707.88	338.57	576.97	2964.74	1647.90	1344.95	1158.81	2127.63	4686.78	436.74	655.35
HUNTSVILLE	9,949.50	4,289.99	490.00	456.01	1392.12	215.53	422.63	51.34	546.70	1452.29		196.15
KINGSTON	23,348.09	8,361.05	1024.98	869.32	5402.27	44.63	920.80	498.35	2899.26	1524.13		603.30
KITCHENER	225,144.17	86,658.05	7356.19	324.48	27190.85	46261.29	5454.80	4776.41	14996.09	31320.98	179.28	595.17
LAKEVIEW	140,366.45	44,246.75	2798.17	92.46	17658.69	10556.87	3721.67	2453.37	4113.83	54700.89	680.28	(656.55)
MARKHAM VILLAGE	15,909.13	9,012.72	31.35	860.90	1875.82	672.09	506.12	382.31	1001.38	740.25	710.31	115.88
NEPEAN TWP.	32,490.61	13,964.02	889.11	798.64	6732.66	1174.07	1305.71	1967.99	3855.67	1058.26		764.48
NEWMARKET	32,566.48	14,931.03	666.64	1344.63	6136.11	1745.41	1082.60	690.22	419.68	4885.16	248.00	417.00
NORTH BAY	79,171.60	34,491.48	1303.22	125.21	12219.26	1352.28	2438.78	544.38	6008.42	18484.42	1763.92	440.23

TABLE I

CONVENTIONAL ACTIVATED SLUDGE SECONDARY PLANTS

OPERATING COSTS CONT'D

PROJECT	TOTAL	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIP	REPAIRS & MAINT.	SUNDRY	WATER	TRAVEL
ORANGEVILLE	13,525.19	4,818.48		176.12	1315.27	2085.69	443.18	321.21	453.88	3866.61		44.75
PORT COLBORNE	64,498.43	40,804.77	732.81	1411.03	8898.75	1344.17	3989.48	1538.79	1696.61	2874.67	413.99	793.36
PRESTON	36,292.57	16,058.89	2212.36	562.75	4143.37	4164.59	1208.77	772.99	1223.01	3564.98	2144.37	236.49
RICHMOND HILL	50,984.04	14,972.08	4028.44	1051.32	6745.71	4652.76	1355.14	639.63	3377.91	13966.80		294.25
SIDNEY TWP.	7,677.10	2,427.57	399.74	893.47	956.76	347.64	343.44	75.82	275.33	1392.55		564.78
SIMCOE	40,334.44	17,286.31	1142.84	1373.78	9791.04	1354.37	1377.05	1089.39	2687.62	2876.18	1004.82	351.04
STRATFORD	57,079.98	30,095.21	804.39	285.46	5306.61	241.07	3722.79	640.49	2978.32	11975.68	624.96	405.00
STREETSVILLE	14,565.95	5,003.61	2271.56	574.50	1498.06	683.35	409.82	149.31	516.94	3145.41	212.04	101.35
TILLSONBURG	25,142.33	9,659.05		613.39	4533.71	672.09	1192.79	827.40	2365.55	4884.83	125.72	267.80
WATERLOO	140,427.32	41,591.88	1910.00	2140.60	19986.72	15717.05	2683.34	2458.10	20761.84	32464.29		613.50
TOTAL OXIDATION PLANTS												
BURLINGTON SKY.	51,736.82	18,778.08	1208.49		20992.60	1404.14	1861.76	987.17	531.87	5259.21	405.00	308.50
ELORA	6,573.39	4,075.83			1035.26	225.74	403.00	421.42	128.26	213.33		170.49
MOORE TWP.	12,595.65	4,937.00	437.40		3456.32	318.66	484.00	651.92	331.10	1645.35	109.17	224.73
PARIS	8,109.72	4,623.93		89.50	1701.86	37.93	304.10	19.87	392.54	438.54	169.40	332.05
WESTMINSTER	10,514.93	5,011.02	747.25		2231.57	208.58	273.14	461.31	660.55	896.91		124.60
FRANKFORD (TRICKLING FILTER)	4,920.71	3,215.81			422.17	224.03	197.31	67.57	180.67	375.84		237.31

TABLE 11

O W R C WATER POLLUTION CONTROL PLANTS

OPERATING COSTS

1265

PRIMARY TREATMENT

PROJECT	TOTAL OPERATING COSTS	LABOR COSTS			POWER COSTS			MAINTENANCE			SLUDGE DISPOSAL		
		TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.
BELLEVILLE	45121.81	15111.15	33.5	7.30	7300.29	17.5	3.82	3746.92	8.3	1.81	1011.00	2.3	0.49
PORT ERIE	24835.97	11319.81	45.6	21.14	4563.51	18.3	8.52	2354.39	9.5	4.40	575.12	2.3	1.07
PORT FRANCES	29810.65	14980.47	50.1	26.82	4811.01	16.4	8.55	3243.10	11.1	5.76			
PORT WILLIAM	53523.57	28967.35	54.1	42.83	7304.01	13.6	10.80	6546.28	12.2	9.68			
DWEN SOUND	34109.32	15460.05	45.3	12.50	4775.78	14.0	3.86	3726.32	10.9	3.01	2605.65	7.6	2.11
POINT EDWARD	13272.64	6059.86	45.7	85.13	879.48	6.6	12.36	1534.18	11.6	21.55	442.80	3.2	6.22
PORT ARTHUR	44533.19	21750.87	48.8	11.55	5584.06	12.5	2.96	4632.04	10.4	2.46	4758.60	10.7	2.53
PORT DOVER	23343.94	10257.87	43.9	80.82	6028.10	25.8	47.50	4092.91	17.5	32.25			
SAULT STE. MARIE	122349.41	54417.04	44.5	19.22	16196.72	13.2	5.72	13526.98	11.1	4.78	9997.50	8.2	3.53
WINNIE	31001.30	14354.11	43.7	12.75	4701.11	15.2	4.43	3892.21	12.6	3.67			
TRENTON	19519.53	6698.46	34.3	31.17	2552.08	13.1	11.88	4042.06	2.07	18.81			
AVERAGE			44.6	31.91		15.1	10.95		12.4	9.83		5.7	2.66

CONVENTIONAL ACTIVATED SLUDGE SECONDARY PLANTS

BRANTFORD	185704.83	111464.94	60.0	46.53	27748.80	13.3	10.33	12332.69	6.6	5.15	6007.40	3.2	2.51
BRANTFORD	55678.76	22842.32	41.0	27.19	6294.18	11.3	7.49	7588.24	13.6	9.03	867.40	14.5	9.60
BURLINGTON D.O.	37586.43	16718.75	44.5	27.56	6186.78	16.5	10.20	1549.48	7.1	4.37	5574.93	14.8	9.19
BURLINGTON E.G.	21966.58	11887.91	54.1	39.65	3452.32	15.7	11.51	1773.28	8.1	5.91	1551.39	7.1	5.17
CONISTON	12495.52	7359.45	58.9	100.99	1056.58	8.5	14.50	1847.48	14.8	25.35			
FLMIRA	26960.67	16021.78	59.4	101.14	2505.42	9.3	15.82	2543.82	9.4	16.06	336.00	1.2	2.12
FERGUS	21760.15	9564.55	44.0	45.91	1278.14	5.9	6.13	2682.99	12.5	12.88	4369.51	20.1	20.97
GALT	73672.49	38180.21	51.8	20.59	7142.65	9.7	3.85	10223.32	13.9	5.51	3657.76	5.0	1.97
GEORGETOWN	31209.58	16046.45	51.4	46.30	2964.74	9.5	8.56	4631.39	14.8	13.36	3331.80	10.7	9.61
HUNTSVILLE	9949.50	4779.99	48.0	71.72	1392.12	14.0	20.89	1020.67	10.3	15.31	1905.60	19.2	28.59
KINGSTON TWP.	23348.09	10186.03	43.6	56.24	5402.27	23.1	29.83	4318.41	18.5	23.84			
KITCHENER	225144.17	94044.82	41.8	28.26	27190.85	12.1	8.17	25227.30	11.2	7.58	18850.21	8.4	5.66
LAKEVIEW	140366.45	47044.94	33.5	17.93	17658.68	12.6	6.73	10288.87	7.3	3.92	43886.37	31.3	16.73
MARKHAM VILLAGE	15909.13	9044.07	56.8	77.38	1875.82	11.8	16.05	1889.81	11.9	16.17			
NEPEAN TWP.	32490.61	14653.13	45.7	16.76	6732.66	20.7	7.60	7109.37	21.9	8.07			
NEWMARKET	32566.48	15597.67	47.9	32.75	6136.11	18.8	12.88	2192.50	6.7	4.60	834.30	2.6	1.75
NORTH BAY	79171.60	35794.70	45.2	25.94	12219.26	15.4	8.85	8991.58	11.4	6.52	12829.38	16.2	9.30
ORANGEVILLE	13525.19	4818.48	35.6	22.32	1315.27	9.7	6.09	1218.27	9.0	5.64	3525.00	26.1	16.33
PORT COLEORNE	64498.43	41537.58	64.4	56.78	8698.75	13.8	12.16	7224.88	11.2	9.88	1556.35	2.4	2.13
PRESTON	36292.57	18271.25	50.3	55.92	4143.37	11.4	12.68	3204.77	8.8	9.81	2342.90	6.5	7.17
RICHMOND HILL	50984.04	19000.52	37.3	33.36	6745.71	13.2	11.84	5372.68	10.5	9.43	13127.72	25.7	23.05
SIDNEY TWP.	7677.10	2827.31	36.8	35.11	955.76	12.5	11.88	694.59	9.0	8.63	387.00	5.0	4.81

TABLE II

OPERATING COSTS (CONT'D)

PROJECT	TOTAL OPERATING COSTS	LABOR COSTS			POWER COSTS			MAINTENANCE			SLUDGE DISPOSAL		
		TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.	TOTAL	% OF TOTAL	\$ PER M.G.
SIMCOE	40334.44	18429.15	45.7	32.59	9791.04	24.3	17.31	5154.06	12.8	9.11	9394.70	16.5	8.22
STRATFORD	57079.98	32805.60	54.1	27.04	5306.61	9.3	4.64	7341.60	12.9	6.43	2551.30	17.5	12.75
STREETSVILLE	14565.95	7275.17	49.9	36.35	1498.06	10.3	7.49	1075.07	7.4	5.38	4087.79	16.3	18.29
WILSONBURG	25142.33	9659.05	38.4	43.22	4533.71	18.0	20.29	4385.74	17.4	19.62	25565.88	18.2	27.67
WATERLOO	140427.32	43601.88	31.0	47.13	19285.72	14.2	21.63	25903.28	18.4	28.03			
AVERAGE			47.2	43.43		13.5	12.05		11.7	10.95		13.1	11.07
TOTAL OXIDATION PLANTS													
BURLINGTON SKY.	51736.82	19986.57	38.6	20.71	20992.60	40.6	21.75	3380.80	6.5	3.50	2751.37	5.3	2.85
ELORA	6679.39	4075.83	61.0	310.87	1035.26	15.5	78.96	958.74	14.4	73.12	23.60	0.4	1.80
MOORE TWP.	12595.65	5374.40	42.7	164.75	3456.32	27.4	105.95	1467.02	11.6	44.97			
PARIS	8109.72	4623.93	57.0	30.88	1701.86	21.0	11.37	716.51	8.8	4.79			
WESTMINSTER	10614.93	5758.27	54.2	103.34	2231.57	21.0	40.05	1395.00	13.1	25.04	327.25	3.1	5.87
AVERAGE			44.4	32.73		32.8	24.18		8.8	6.51		4.5	3.00
FRANKFORD (TRICKLING FILTER)	4920.71	3215.81	65.4	47.61	422.17	8.6	6.25	445.55	9.1	6.60			

TABLE III

OPERATING COSTS

1965

PRIMARY PLANTS

PROJECT	DESIGN CAPACITY MGD	ACTUAL FLOW MGD	OPERATING COSTS	MG TREATED 1965	COST/MG \$	COST/LB BOD REMOVED \$	COST/LB SS REMOVED \$
BELLEVILLE	3.0	5.67	45121.81	2070	21.80	0.050	0.023
FORT ERIE	1.8	1.47	24836.97	535.5	46.33	0.119	0.146
FORT FRANCES	2.0	1.84	29310.65	*552.8	52.08	NO LABORATORY ANALYSIS	
FORT WILLIAM	6.0	1.85	53523.57	676.36	79.13	0.234	0.176
OWEN SOUND	3.0	3.39	34109.32	1236.31	27.59	0.061	0.024
POINT EDWARD	0.57	0.197	13272.64	71.180	184.83	0.232	0.116
PORT ARTHUR	4.0	5.16	44533.19	1883.74	23.64	0.034	0.180
PORT DOVER	2.1	0.348	23343.94	126.92	183.93	0.088	0.157
SAULT STE. MARIE	8.0	7.76	122349.41	2831.10	43.22	0.071	0.058
TIMMINS	3.0	2.908	31001.30	1061.286	29.21	0.028	0.018
TRENTON	1.0	0.59	19519.53	214.87	90.84	0.045	0.083
AVERAGE					71.15	0.097	0.098
* 306 DAYS DATA							
CONVENTIONAL ACTIVATED SLUDGE SECONDARY PLANTS							
BRANTFORD	12.5	6.56	185704.83	2395.36	77.53	0.058	0.049
BRAMPTON/CHINGUACOUSY	2.0	2.302	55678.76	840.14	66.27	0.019	0.010
BURLINGTON D. L.	2.5	1.662	37586.43	506.72	61.95	0.029	0.010
BURLINGTON E. G.	0.75	0.822	21966.58	299.86	73.25	0.060	0.054
CONISTON	0.26	0.200	12495.59	72.87	171.47	0.121	0.075
ELMIRA	0.68	0.434	26960.67	158.41	170.20	0.156	0.257
FERGUS	0.60	0.571	21760.15	208.34	104.45	0.031	0.046
GALT	5.0	5.079	73572.49	1853.88	39.74	0.036	0.033
GEORGETOWN	1.5	0.949	31209.58	346.54	90.06	0.155	0.047
HUNTSVILLE	0.25	0.183	9949.50	66.65	149.29	0.110	0.074
KINGSTON TWP.	0.83	0.496	23348.09	181.11	128.92	0.101	0.090
KITCHENER	13.5	9.12	225144.17	3328.10	67.65	0.024	0.018
LAKEVIEW	5.0	7.187	140366.45	2623.25	53.50	0.021	0.022
MARKHAM VILLAGE	0.334	0.32	15909.13	116.88	136.11	0.078	0.051
NEPEAN TWP.	1.5	2.428	32490.61	886.1	36.67	0.087	0.076
NEWMARKET	2.0	1.305	32566.48	476.23	68.38	0.043	0.040
NORTH BAY	4.0	3.781	79171.60	1379.97	57.37	0.059	0.034
ORANGEVILLE	0.75/0.170 sec	0.593	13525.19	215.853	62.66	0.062	0.079
PORT COLBORNE E.	0.85	1.056		385.429			
PORT COLBORNE W.	0.9 DWF/3.600	0.948		346.084			
COMBINED			64498.43	731.513	88.17	0.105	0.077
PRESTON	1.8	0.895	36292.57	326.714	111.08	0.029	0.024
RICHMOND HILL	1.6	1.560	50984.04	569.643	89.30	0.045	0.028
SIDNEY TWP.	0.12	0.22	7677.10	80.53	95.33	0.258	0.129
SINCOE (COMBINED)	2.0	1.549	40344.44	565.531	71.32	0.022	0.035
STRATFORD	4.0	3.13	57079.98	1142.53	49.96	0.026	0.023
STREETSVILLE	0.8	0.548	14565.95	200.115	72.79	0.024	0.023
TILLSONBURG	0.665	0.612	25142.33	223.489	112.49	0.062	0.050
WATERLOO	4.0	2.532	140427.32	924.094	151.96	0.039	0.047
AVERAGE					91.04	0.069	0.056

TABLE III

OPERATING COSTS (CONT'D)

TOTAL OXIDATION PLANTS

PROJECT	DESIGN CAPACITY MGD	ACTUAL FLOW MGD	OPERATING COSTS	MG TREATED 1965	COST/MG \$	COST/LB BOD REMOVED \$	COST/LB SS REMOVED \$
BURLINGTON SKY.	3.125	2.645	51736.82	965.290	53.60	0.026	0.011
FLORA	0.083	0.036	6679.39	13.111	509.45	0.316	0.227
MOORE TWP.	0.32	0.089	12595.65	32.622	386.11	0.215	0.197
PARIS	0.5	0.410	8109.72	149.272	54.16	0.030	0.038
WESTMINSTER	0.25	0.153	18614.93	55.719	190.49	0.108	0.050
AVERAGE					238.76	0.139	0.104
FRANKFORD *	0.12/0.54	0.185	4920.71	67.542**	72.85	0.061	0.057
** ESTIMATED ON NON-RECIRCULATED FLOWS							

FIG. No. 1

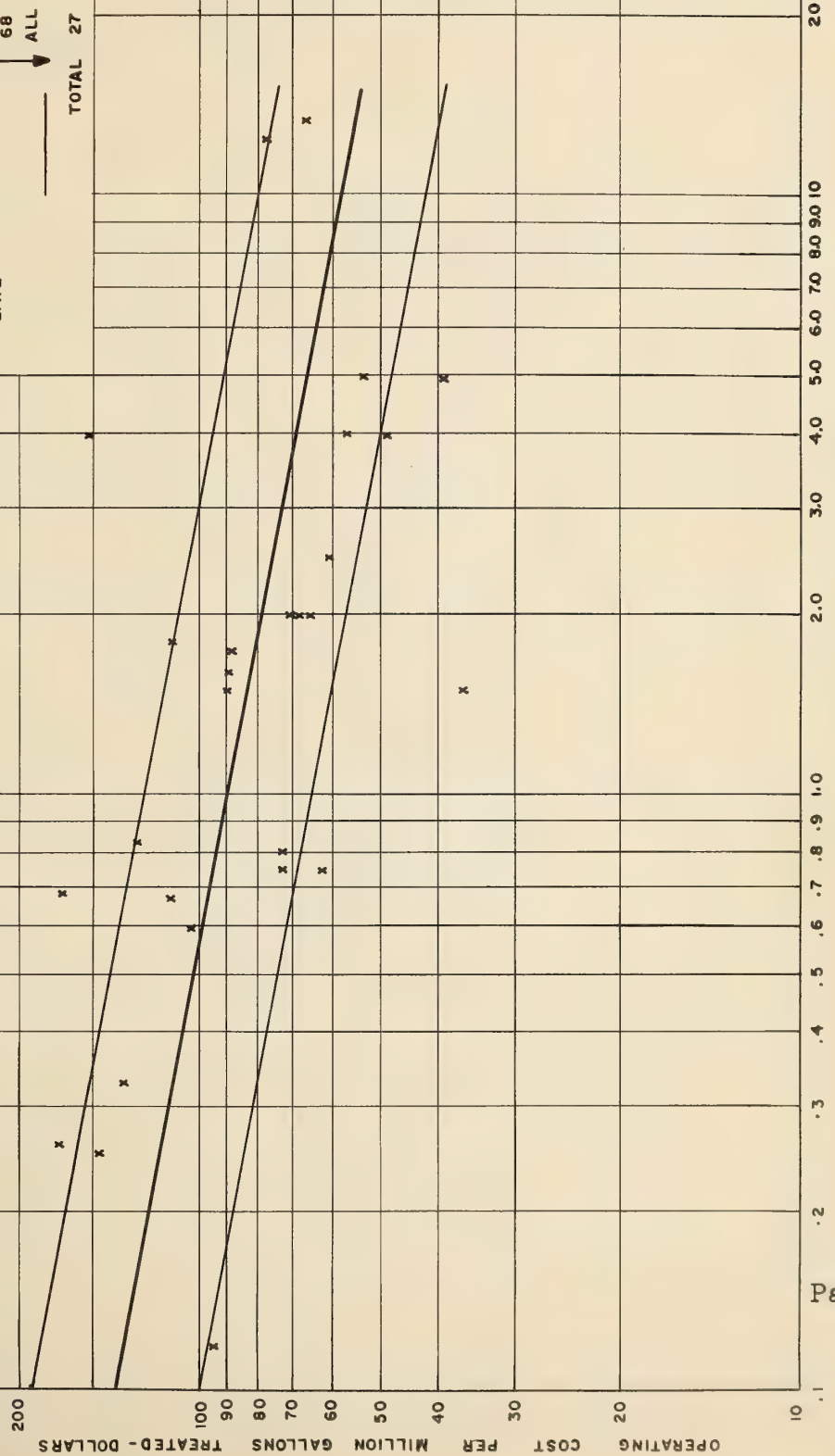
1965 OPERATING COSTS

CONVENTIONAL ACTIVATED SLUDGE PLANTS

COST PMG TREATED VS DESIGN CAPACITY MGD

LEGEND

REGRESSION LINE →
 RANGE INCLUDES 68 % OF ALL PLANTS
 TOTAL 27 PLANTS



DESIGN CAPACITY - MILLION GALLONS PER DAY

FIG. No. 2

1965 OPERATING COSTS PRIMARY TREATMENT PLANTS

COST PMG TREATED VS DESIGN CAPACITY MGD

LEGEND

REGRESSION LINE
RANGE INCLUDES 68% OF ALL PLANTS
TOTAL 11 PLANTS

500

400

300

TREATED - DOLLARS

100

90

80

70

60

50

40

30

20

10

PER MILLION GALLONS

OPERATING COST

PER MILLION GALLONS

DESIGN CAPACITY - MILLION GALLONS PER DAY

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.2

.3

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.5

.6

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FIG. No. 3

1965 OPERATING COSTS

CONVENTIONAL ACTIVATED SLUDGE PLANTS

COST PMG TREATED VS ACTUAL FLOW

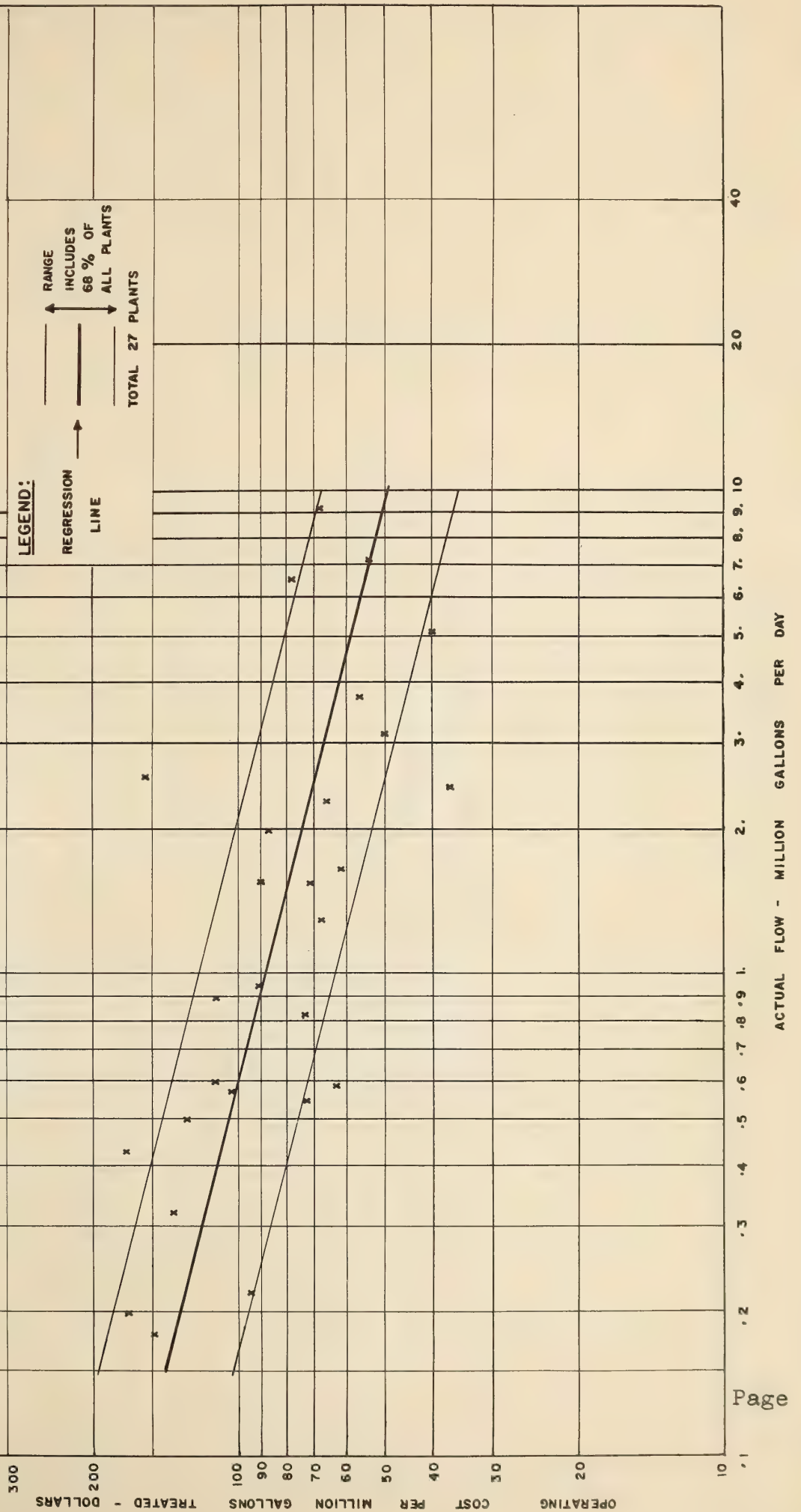


FIG. No 4

1965 OPERATING COSTS PRIMARY TREATMENT PLANTS

COST PMG TREATED VS ACTUAL FLOW MGD

LEGEND

REGRESSION
LINE

RANGE
INCLUDES
68 % OF
ALL PLANTS

TOTAL 11 PLANTS

OPERATING COSTS PER MILLION GALLONS TREATED - DOLLARS

ACTUAL FLOW - MILLION GALLONS PER DAY

40

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